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**Presentation title:** Assessment of county-level proxy variables for household firearm ownership: Implications for gun violence and crime research

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A critical component to understanding the impact of policies on firearm violence and crime is information on the prevalence of firearm ownership in geographic units of interest. Due to legal restrictions, the United States does not have national or universal firearm registries, making a reliable proxy variable essential for understanding how policies impact firearm violence and crime. Much of the existing literature on proxies for firearm ownership pertains to state-level analyses. We evaluated how well proxy variables for firearm ownership used in county-level studies measure reported household firearm ownership. We applied Bayesian spatial small area estimation methods to calculate county-level estimates of household firearm ownership using Behavioral Risk Factor Surveillance System (BRFSS) data (2013-2018). We compared these estimates to four proxies for county-level firearm ownership: the proportion of suicides that were firearm suicides, the average of the proportion of suicides that were firearm suicides and the proportion of homicides that were firearm homicides, gun shops per capita, and federal firearm licenses per capita. We included all U.S. counties for which BRFSS data on household firearm ownership were collected and available for release (n=304). The median prevalence of household firearm ownership was 46.6% (interquartile range: 37.2%, 56.4%). The per capita rate of federal firearm licenses was most strongly correlated with household firearm ownership ( $r=0.70$ ; 95% CI: 0.63, 0.75) followed by the proportion of suicides that were firearm suicides ( $r=0.45$ ; 95% CI: 0.36, 0.54). These correlations were stronger among counties of  $\geq 250,000$  people. The per capita rate of federal firearm licenses was the best proxy for firearm ownership at the county level; however, identification or development of a strong proxy measure among both urban and rural counties for use in county-level analyses is warranted. This will improve our understanding of the impact of policies on firearm violence and crime.